

ABSTRACT OF THE DISCLOSURE

A method is described for enhancing mass and heat transport of fluids in a fine pore structure through an appropriate modulation of the fluid pressure. For
5 example, in an air drying process for a porous material that contains liquid, the air pressure is modulated throughout the volume of the drying chamber. Alternatively, the fluid pressure is modulated in a process stream. As an example, this method can be used for rapid drying of any open porous substances ranging from small
10 pored materials such as aerogels and xerogels, to larger pored substances or articles such as industrial articles, agricultural articles (e.g., densely stacked vegetables, coffee beans, hops and other grains), paper-based products, thin films, pharmaceuticals, cloth, and clothing.